REMARKS

I. Introduction

Claims 1 to 8 and 10 to 21 are pending in the present application. In view of the foregoing amendments and the following remarks, it is respectfully submitted that the present application is in condition for immediate allowance, and reconsideration is respectfully requested.

II. Amendment to the Specification

The Specification has been amended herein without prejudice to correct a typographic error to change "continuation" to --continuation-in-part--. No new matter has been added.

III. Rejection of Claims 2 and 3 Under 35 U.S.C. § 112

Claims 2 and 3 were rejected under 35 U.S.C. § 112, second paragraph, as indefinite. The Office Action alleges that the requirement in claim 2 that a high-frequency pulsed, low-frequency modulated power is injected contradicts the requirement in claim 1 of "refraining from injecting a high-frequency power into the etching body via a substrate electrode." The Office Action seems to be ignoring the feature of claim 1 which requires refraining from injecting a high-frequency power into the etching body via a substrate electrode ***when at least approximately ambipolar plasma is present***. Claim 2 recites "***at least temporarily***" injecting a high-frequency pulsed, low-frequency modulated high-frequency power into the etching body. These requirements are not in contradiction. The injection required by claim 2 may be performed at a time when at least approximately amipolar plasma is not present. Therefore, Applicants respectfully submit that claim 2, as well as claim 3 which depends from claim 2, fully comply with the requirements of 35 U.S.C. § 112 . Withdrawal of this rejection is, therefore, respectfully requested.

IV. Rejection of Claims 1 to 8, 10, and 18 to 20 Under 35 U.S.C. § 102(b)

Claims 1 to 8, 10, and 18 to 20 were rejected under 35 U.S.C. § 102(b) as anticipated by DE 199 57 169A ("DE '169"). Applicants respectfully submit that Laermer et al. do not anticipate the present claims for at least the following reasons.

As an initial matter, Applicants do not necessarily agree with the contention that "USP 6,926,844 is [a] true translation of the reference DE 199 57 169A." To the extent that the text of DE '169 is relied upon, it is respectfully requested that the Examiner provide

an English-language translation of DE '169, as required pursuant to M.P.E.P. § 706.02 ("If the document is in a language other than English and the examiner seeks to rely on that document, a translation ***must*** be obtained so that the record is clear as to the precise facts the examiner is relying upon in support of the rejection." (emphasis added)).

Laermer et al. purportedly relate to a plasma etching method having pulsed substrate electrode power. Nowhere do Laermer et al. disclose refraining from injecting a high-frequency power into the etching body via a substrate electrode if an at least approximately ambipolar plasma is present, as required by claim 1, or modulating the intensity of the plasma as a function of time, as required by independent claim 7. Nor do Laermer et al. disclose injecting a first pulse train into the etching body via a substrate electrode, injecting a second pulse train into the plasma for modulating a plasma intensity over time, wherein a fixed, integral phase ratio exists between the first pulse train and the second pulse train, as required by independent claim 4.

Other than generally stating that the plasma source produces a high-density plasma made of neutral radicals and electrically charged particles (ions), Laermer et al. simply do not discuss the plasma, let alone when the plasma has reached an ambipolar state, as required by independent claim 1, modulating the intensity of the plasma over time, as required by independent claim 7, or establishing a relationship between power delivered to the plasma and power delivered to the etching body, as required by independent claim 4. See col. 5, lines 30 to 33. Nor do Laermer et al. state that their generator unit 30 , used to produce the high-frequency-pulsed high-frequency power coupled into substrate electrode 12 and etching body 18 (U.S. Patent No. 6,926,844, col. 5, lines 50 to 52), is controlled so as to assure that power is not injected into the etching body via a substrate electrode if an at least approximately ambipolar plasma is present or is in any manner coordinated with a generator used to deliver power to the plasma.

The Office Action relies on the Abstract and col. 5, line 30 to col. 6, line 25 of U.S. Patent No. 6,926,844 and states that Laermer et al. teach that power delivered to the etching body may be modulated at a low frequency, which inherently reads on the claimed limitation "at least approximately ambipolar plasma." Respectfully, the relied upon portion of U.S. Patent No. 6,926,844 refers to power delivered to the substrate electrode 12 and/or etching body 18 not the plasma. Even if Laermer et al. discuss modulating power to the electrode 12 and/or etching body 18 at a low frequency, Laermer et al. do not disclose that this low frequency is timed to occur when the plasma is in an ambipolar state, *i.e.*, when the

generator used to deliver power to the plasma (not shown by Laermer et al.) is at least partially shut down (see, for example, the Specification at p. 15, lines 24 to 27).

The Office Action further relies upon Figures 1a to 1c and states that Laermer et al. modulate the intensity of the plasma between a maximum and minimum value. However, Figures 1a to 1c show the power delivered to the substrate electrode 12 and/or etching body 18 not the plasma. See, for example, U.S. Patent No. 6,926,844, col. 6, lines 34 to 38.

Therefore, Applicants respectfully submit that Laermer et al. do not disclose all of the features of claims 1, 4, and 7 and, consequently, do not anticipate claims 1, 4, and 7.

As for claims 2, 3, and 18 to 20, which ultimately depend from claim 1 and therefore include all of the features of claim 1, and claims 5 and 6, which ultimately depend from claim 4 and therefore include all of the features of claim 4, and claims 8 and 10, which depend from claim 7 and therefore include all of the features of claim 7, is respectfully submitted that Laermer et al. do not anticipate these dependent claims for at least the same reasons given above in support of the patentability of claims 1, 4, and 7, respectively.

Therefore, in view of all of the foregoing, withdrawal of this rejection is respectfully requested.

V. Rejection of Claims 11 to 15 Under 35 U.S.C. § 103(a)

Claims 11 to 15 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Laermer et al. and U.S. Patent No. 5,290,383 ("Koshimizu"). Applicants respectfully submit that the combination of Laermer et al. and Koshimizu does not render unpatentable claims 11 to 15 for at least the following reasons.

Laermer et al. purportedly relate to a plasma etching method having pulsed substrate electrode power. Koshimizu purportedly relate to a plasma-process system with an improved end-point detecting scheme. Nowhere does the combination of Laermer et al. and Koshimizu disclose, or even suggest, at least at one time at which an at least approximately ambipolar plasma is present, adding to the plasma an inert gas that is at least one of light and easily ionizable, as required by independent claim 11. The Office Action refers to col. 14, lines 29 to 41 where Koshimizu states that certain gases are introduced into the etching chamber prior to application of power to the electrodes 106 and 108. However, Koshimizu does not state that these gases are introduced at a time when at least approximately ambipolar plasma is present in the chamber. On the contrary, in Koshimizu the gases are introduced even before generation of the plasma in the chamber. See col. 14, lines 43 to 47. Therefore,

the combination of Laermer et al. and Koshimizu does not disclose, or even suggest, all of the features of independent claim 11.

In rejecting a claim under 35 U.S.C. § 103(a), the Examiner bears the initial burden of presenting a prima facie case of obviousness. In re Rijckaert, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish prima facie obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. In re Merck & Co., Inc., 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art references must teach or suggest all of the claim limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). As indicated above, the combination of Laermer et al. and Koshimizu does not disclose, or even suggest, all of the features of claim 11, from which claims 12 to 15 depend. Therefore, Applicants respectfully submit that claims 11 to 15 are not rendered unpatentable by the combination of Laermer et al. and Koshimizu. Withdrawal of this rejection is therefore respectfully requested.

VI. Rejection of Claims 16 and 17 Under 35 U.S.C. § 103(a)

Claims 16 and 17 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Laermer et al. and U.S. Patent No. 5,779,925 ("Hashimoto e al."). Applicants respectfully submit that the combination of Laermer et al. and Hashimoto et al. does not render unpatentable claims 16 and 17 for at least the following reasons.

Hashimoto et al. purportedly relate to plasma processing with less damage. The Office Action alleges that Hashimoto et al. disclose that the RF bias is synchronized with the on/off modulation in order to reduce charging damage without lowering the throughput. However, nowhere does the combination of Laermer et al. and Hashimoto et al. disclose, or even suggest, the specific relationship between the plasma pulse frequency and the power injected into the etching body required by independent claim 16, *i.e.*, setting as a plasma pulse frequency an odd-numbered multiple of a frequency of a low-frequency modulation of a high-frequency power injected into the etching body via a substrate electrode, and synchronizing the first modulation and the low-frequency modulation with one another so that n plasma pulses (n = 1, 2, 3, ...) fall in each pulse injected into the etching body using the substrate electrode while n + 1 plasma pulses occur during a pause in an energy injection into the

etching body. Therefore, the combination of Laermer et al. and Hashimoto et al. does not render unpatentable independent claim 16 or claim 17, which depends from and therefore includes all of the features of claim 16. Withdrawal of this rejection is therefore respectfully requested.

VII. Rejection of Claim 21 Under 35 U.S.C. § 103(a)

Claim 21 was rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Laermer et al. and U.S. Patent No. 4,799,991 ("Dockrey"). Applicants respectfully submit that the combination of Laermer et al. and Dockrey does not render unpatentable claim 21 for at least the same reasons submitted above in support of the patentability of claim 1, from which claim 21 depends. Specifically, Applicants respectfully submit that the combination of Laermer et al. and Dockrey does not disclose, or even suggest, refraining from injecting a high-frequency power into the etching body via a substrate electrode if an at least approximately ambipolar plasma is present, as required by claim 1. Dockrey purportedly relates to a process for differentially etching polycrystalline silicon. Dockrey does not remedy the above-noted deficiencies of Laermer et al. Nor is Dockrey relied upon for remedying the above-noted deficiencies of Laermer et al. Therefore, Applicants respectfully request withdrawal of the present rejection.

VIII. Conclusion

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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